IDD 9518
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cc:

Subject: Turndown Schedule

In conjunction with the previously distributed Pocatello Resource Recovery and Turndown Plan, we have developed a Turndown Schedule that is provided in the attached file. The Plant Shutdown Waste Material Summary presented in Table 4 of the Supplemental Response to Questions was based on this Turndown Schedule. A hard copy of the document will be sent to the following route list today: Bill Kline, EPA-HQ; Andy Boyd, Linda Meyer, Sylvia Burges, and Gil Haselberger, EPA-10; Ft. Hall Business Council Chairman, Jeanette Wolfley, and Susan Hanson, Shoshone Bannock Tribes. Please forward this e-mail to others in your organizations as appropriate.

[redacted]

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Turndown Schedule for the Astaris Pocatello Plant

November 13, 2001

Summary of Turndown Plan

On October 11, 2001, Astaris announced that the Pocatello Plant would cease production by the end of December 2001. Astaris plans to cease phosphorus production from #3 Furnace on or about December 10, 2001 followed by a 7-day period to remove phosphorus product from tanks and sumps and load this product into rail cars for shipment to customers. All P4 production work activity at the Pocatello Plant should end on or about December 17. Between October and December 17, plant personnel will institute a phased turndown of Plant processes coupled with winterization efforts to ensure that critical systems are protected from freezing.

Major pieces of equipment not operating as of October 26 are shale receiving and unloading (rail car unloading), shale stockpiling, #1 Calciner (and associated equipment), and #1, #2, and #4 Furnaces (and associated CO gas handling and slag ladling equipment). Shale receiving and unloading has been secured and weatherized. Information on the status of other currently idled equipment is provided below under Turndown Plan.

Major pieces of equipment that continue to operate are the reclaim wheel, shale crushing and screening, briquetting building, #2 Calciner (and associated equipment), nodule stockpiling and reclaiming, nodule fines management, the proportioning building, nodule sizing, #3 Furnace (and associated CO gas handling and slag ladling equipment), the secondary condenser, the XSCO burner, the phosphorus loading dock, and the (steam) boilers. All air pollution control equipment associated with the process equipment will continue to operate until the source ceases operation. Certain air pollution control equipment will be maintained in an operable condition for potential use in controlling fugitive emissions while decontaminating equipment. The process equipment will be shut down on various dates followed by isolation, appropriate cleaning, weatherization, and securing as described in greater detail below.

Turndown Schedule

Plant personnel are instituting a phased turndown of the operating equipment listed above. The schedule for this phased turndown is described more fully below.

1. Shale Berms

The reclaim wheel removed as much shale as possible from the North Berm by October 19. The reclaim wheel was moved to the South Berm and will continue to operate on the South Berm until about November 10. Shale on the contingency pile will be removed by about November 12.

2. #1 Calciner

#1 Calciner was shut down September 7, 2001 per the normal operating schedule. After the announcement on October 11 that the Plant would cease production, planning for the cleaning and weatherization of #1 Calciner began immediately. On October 24, the CO gas supply line to #1 Calciner was washed following routine procedures for a maintenance outtage. P4 washed from the CO line was pumped to the phos dock for loading/processing. On October 25, the #1 Calciner scrubbers and associated water system piping were cleaned and drained. Removal of dry material from the #1 Calciner windboxes and primary header will begin on or about November 8 and will take approximately 7 to 8 days.

3. #1 Furnace

#1 Furnace was shut down in October 2000 because of high power costs. The #1 Furnace was disconnected from the power supply in April 2001 and the decision was made to decontaminate and demolish this furnace and ancillary equipment. Decontamination and demolition commenced in May and has progressed during the course of 2001. Certain ancillary furnace equipment has been removed from the Furnace Building and the furnace contents were removed with the intent to recycle this material to the operating furnace. With the October 11 announcement to terminate production, only a minimal amount of #1 Furnace material can be recycled before the last furnace is shut down. Decontamination and demolition of #1 Furnace will proceed on a low priority basis during turndown and shutdown.

4. #4 Furnace

#4 Furnace was shut down on April 1, 2001 because of high power costs. The #4 Furnace was disconnected from the power supply in April 2001 and washed and secured for potential re-energizing if needed in the future. On October 16, work began to decontaminate #4 Furnace and ancillary equipment containing residual P4. These systems include the sumps, pressure relief valve (PRV), and CO line. The furnace contents will not be removed during turndown and shutdown.

5. #2 Furnace

#2 Furnace was shut down on August 15, 2001 per the normal operating schedule for one furnace operation. #2 Furnace is being held in reserve for use during the turndown if #3 Furnace needs to be shutdown due to an upset condition. On or about November 24, if #2 Furnace is not utilized, the electrodes from #2 Furnace will be removed. The sump, CO line and PRV will then be washed following routine procedures for a maintenance outtage.

6. Phosphorus Dock Storage Tanks

On October 16, preparations were initiated for cleaning of #4 Tank. Cleaning of the tank began on October 24. Tanks 1, 2 and 3 will be cleaned following completion of #4 tank. Phosphorus materials from these tanks will be processed on the phosphorus dock for recovery and recycle as centrifuge product (CP).

7. Secondary Condenser

The secondary condenser will be shut down, isolated, and prepared for long-term weatherization starting on or about November 14. The condenser will be cooled down, water systems drained, and a nitrogen purge will be established on the vessel to prevent the possibility of fire. On or about November 15, the contents of the secondary condenser sump (P4 product) will be pumped directly to a rail car. After this date, the small amounts of P4 that will be collected in the secondary sumps will be sent to the phosphorus dock for loading into railcars as P4 product. The secondary condenser sumps must be maintained in a hot condition to support the continued operation of the XSCO combustor. On or about November 15, the secondary condenser cooling tower will be emptied.

8. #2 Calciner

#2 Calciner will produce nodules until November 14. On or about November 14, #2 Calciner will be isolated and work will begin to wash the CO line associated with #2 Calciner, wash and drain the scrubber system, and remove dry materials from the windboxes and primary header which is expected to be completed on or about December 1. The handling systems (dry lime injection and lime slaking) and water treatment system will be flushed and cleaned after #2 calciner is isolated. After November 14, only the stockpiled nodule inventory will be fed to the operating furnace. The nodule stockpile is expected to be depleted on or about December 10.

9. Calciner Ponds

Following the shutdown of #2 Calciner, any remaining calciner scrubber water in Calciner Pond 2C will be transferred to Calciner Pond #5C in preparation for draining the calciner scrubber return water supply lines. The water level in Pond 2C must be lowered below the return water lines in order to isolate/drain the water lines from Pond 2C to the calciner scrubbers to prevent freezing during the winter. Draining Pond 2C is environmentally important because a frozen line could break and possibly rupture. The calciner ponds will remain isolated with water and sediments in place until a decommissioning/remediation plan is developed.

10. Shale Handling, Crushing, and Screening System

When the #2 Calciner stops producing nodules on or about November 12, then shale feed will no longer be needed. The shale handling, crushing, and screening system will be depleted of shale as much as possible. The outdoor crushed shale contingency pile will be removed on or about November 12. The reclaimer wheel will be backed out of the shale berm and prepared for storage.

11. Coke Unloading

The coke unloading building and associated dust collection and baghouses will remain in operation until about December 10. The coke unloading system will be run out and emptied as much as possible.

12. Briquetting Building

Similar to shale handling, when the #2 Calciner stops producing nodules on or about November 12, then shale briquetting will no longer be needed. Conveyors, feed chutes and bins will be emptied with the exception of bins #3, 4 and 8 which are expected to have oversized material that will require additional effort to empty.

13. Phosphorus Dock Centrifuge System

On December 7, centrifuge product (CP) delivery from the phos dock to the operating furnace will be stopped. The CP system will be flushed and secured following routine procedures for a maintenance outtage.

14. #3 Furnace

On or about December 10, the last operating furnace - #3 Furnace - will cease production of phosphorus. The CO line will be isolated and the process of purging the line will commence. All phosphorus product will be pumped to the phosphorus dock. On or about December 11, washing of the #3 precipitators will begin. This work will take approximately 3 to 4 days. Following the shutdown of #3 Furnace, any process equipment that was not isolated/secured during turndown will be secured, isolated, and fire prevention purges will be established as appropriate.

> Environmental Note: All of the furnace Medusa/Andersen scrubbers and the industrial clarified water (ICW) system will be maintained in an operable condition in order to support further decommissioning and securing activities and potentially to support future demolition work on the furnaces.

15. XSCO Combustor

The XSCO Combustor will be shutdown after final purging of the CO line is completed. The CO line will be purged after the last operating furnace is shutdown, cools down and stops degassing. A nitrogen purge will be maintained on the CO line until such time as the line can be decommissioned. At the time the XSCO combustor is shutdown and cooled down (2 to 3 days), work will begin to prepare all systems for extended shutdown.

16. Proportioning Building

When the #3 Furnace stops producing phosphorus on or about December 10, then furnace feed will no longer be needed and the proportioning building will be closed. Feed chutes and conveyors will be run out and bins emptied as much as possible.

17. Nodule Sizing

When the #3 Furnace stops producing phosphorus on or about December 10, then furnace feed will no longer be needed and the nodule sizing equipment will be closed. Feed chutes, bins and conveyors will be run out and emptied as much as possible.

18. Slag Ladling and Slag Pile

When the #3 Furnace stops producing phosphorus on or about December 10, the furnace will no longer produce slag and slag ladling will be discontinued.

19. Phosphorus Dock Area

After the furnace ceases production of phosphorus on or about December 10, all sumps and tanks will be pumped down to load phosphorus product. The phosphorus product will be loaded into rail cars for shipment to customers. All P4 production work activity at the Pocatello Plant will cease on or about December 17. Cleaning of returned rail cars (containing phossy water and "heels" of precipitated phosphorus compounds) will continue throughout the turndown period.

20. Plant Boilers

The steam boilers, fired on natural gas, will continue to operate to prevent line freezing during the winter. Steam condensate currently discharges to Pond 18, and we intend to continue this discharge during winter and spring 2002 which will decrease the potential for the pond freezing. The ICW system (decant water pumped from Pond 18 Cell B) will remain in operable condition to charge the Furnace Building fire suppression water systems.

21. Ponds

Discharge of phosphorus production wastes (precipitator slurry and furnace washdown) from the production areas of the Plant will cease on or about December 17. Steam condensate currently discharges to Pond 18, and we intend to continue this discharge during winter and spring 2002 which will decrease the potential for the pond freezing. The ICW system (decant water pumped from Pond 18 Cell B) will remain in operable condition to charge the Furnace Building fire suppression water systems. The Pond Management Plan will continue to be implemented after December 17, including security and air monitoring, until final closure activities are completed.

< END >

Table 1
Estimated Quantities of P4 Sludge/Heels and Phossy Water - Resource Recovery and Turndown Plan

Equipment / System	Sludge/Heel (weight %)				Quantity (klbs)				Number 30 Gal Drums	
	P4 Range		Water Range							
	Low	High	Low	High	P4 in Sludge & Heel	Sludge	Heel Sludge	Water	Sludge & Heel	Water
Total Furnace Area	**20**	**50**	**30**	**70**	**40**	**30**	**50**	**290**	**340**	**1,120**
Total Sec Cond.	**75**	**90**	**10**	**30**	**50**	**0**	**110**	**1,070**	**440**	**4,270**
Total Phos Dock	**20**	**50**	**30**	**70**	**170**	**200**	**170**	**1,480**	**1,480**	**5,910**
Subtotal Process Areas					**260**	**230**	**330**	**2,840**	**2,260**	**11,300**
Rail Cars										
Sludge	20	50	30	70	20	40		10	160	40
Empty P4 Shipping	30	80	5	60	300		680	5,410	2,710	21,670
Sub Total Rail Cars					**320**	**40**	**680**	**5,420**	**2,870**	**21,710**
TOTAL					**580**	**270**	**1,010**	**8,260**	**5,130**	**33,010**

	Quantity
Furnace Burden	(k lbs)
No. 1 Furnace	540
No. 2 Furnace	670
No. 3 Furnace	670
No. 4 Furnace	630

Burden contains some precipitator dust like materials. NORM needs to be investigated.

Table 2
Estimated Quantities of P4 Sludge/Heels and Phossy Water - Immediate Shutdown Scenario

Equipment / System	Sludge/Heel (weight %)				Quantity (klbs)				Number 30 Gal Drums	
	P4 Range		Water Range							
	Low	High	Low	High	P4 in Sludge & Heel	Sludge	Heel Sludge	Water	Sludge & Heel	Water
Total Furnace Area	**20**	**50**	**30**	**70**	**40**	**30**	**50**	**290**	**340**	**1,120**
Total Sec Cond.	**75**	**90**	**10**	**30**	**50**	**0**	**110**	**1,070**	**440**	**4,270**
Total Phos Dock	**20**	**50**	**30**	**70**	**340**	**590**	**170**	**1,480**	**3,040**	**5,910**
Subtotal Process Areas					**430**	**620**	**330**	**2,840**	**3,820**	**11,300**
Rail Cars										
Sludge	20	50	30	70	567	1,260		10	5,042	40
Empty P4 Shipping	30	80	5	60	305		678	25,340	2,713	101,400
Sub Total Rail Cars					**870**	**1,260**	**680**	**25,350**	**7,760**	**101,440**
TOTAL					**1,300**	**1,880**	**1,010**	**28,190**	**11,580**	**112,740**

	Quantity
Furnace Burden	(k lbs)
No. 1 Furnace	540
No. 2 Furnace	670
No. 3 Furnace	670
No. 4 Furnace	630

Burden contains some precipitator dust like materials. NORM needs to be investigated.

Table 3. Updated List of Potential Disposal Facilities (November 2, 2001). (Updated From Case-By-Case Application Capacity Survey)

TSD Facility	Facility Type	Location		Comment
		City	State	
1. Trade Waste Incineration	I	Sauget	IL	Cannot accept NORM-containing waste; last contact 11/1/01
2. ENSCO	I	El Dorado	AR	Awaiting reply; last contact 11/1/01
3. Von Roll	I	East Liverpool	OH	Awaiting reply; last contact 10/31/01
4. Clean Harbors	I	Kimball	NE	
5. Ross Incinerator Services	I	Grafton	OH	
6. Safety Keen	I	Bridgeport	NJ	Closed
7. Safety Kleen	I	Roebuck	SC	Closed
8. Safety Kleen	I	Deer Park	TX	Awaiting reply; last contact 10/31/01
9. Waste Management	I	Port Arthur	TX	
10. Safety Kleen	I	Salt Lake City	UT	
11. Duratek	I	Oak Ridge	TN	Reviewing waste analytical information; last contact 11/1/01

Facility Type: I = Incinerator

TABLE 4

Based on Resource Recovery and Turndown Plan

Equipment / System	Plant Shutdown Waste Material Summary									Level of Effort for Removal/Packaging			
										Man-days for Removal/Packaging		Years for Removal/Packaging	
	Capacity	Concentration (% wt)			Quantity (k lbs)				30 Gal Drums	With use of Pond	Without use of Pond	Assuming 4 x 4 man crew	Assuming 4 x 4 man crew
	(ft3)	P4	Dirt	Water	P4	Dirt	Water	Sludge	(Number)	for water management	for water management	with use of Pond	without use of Pond
Furnace Building													
No. 1 Fce P4 Sump (V-1231)	Cleaned									0	0	0.00	0.00
No. 2 Fce P4 Sump (V-2231	1,471	10	1	89	10	1	90	10	400	175	225	0.04	0.06
No. 3 Fce P4 Sump (V-3231)	1,471	10	2	88	10	2	90	20	410	175	225	0.04	0.06
No. 4 Fce P4 Sump (V-4231)	267	31	6	63	10	2	20	20	130	105	175	0.03	0.04
No. 1 Fce P4H2O Sump	Cleaned									0	0	0.00	0.00
No. 2 Fce P4H2O Sump	535	4	1	96	1	0.2	30	2	130	25	35	0.01	0.01
No. 3 Fce P4H2O Sump	535	4	1	96	1	0.2	30	2	130	25	35	0.01	0.01
No. 4 Fce P4H2O Sump	134	11	2	88	1	0.2	10	2	50	25	35	0.01	0.01
V-3700	100	11	1.8	88	1	0.2	10	2	50	105	115	0.03	0.03
V-3600	100	11	1.8	88	1	0.2	10	2	50	105	115	0.03	0.03
Total Furnace Area					**36**	**6**	**290**	**60**	**1,350**	**740**	**960**	**0.19**	**0.24**
Secondary Condenser													
T-1 Sump	7,300	6	2	92	30	10	460	50	2,000	540	900	0.14	0.23
T-2 Sump	7,300	6	2	92	30	10	460	50	2,000	540	900	0.14	0.23
T-3 Sump	2,178	7	1	93	10	1	140	10	600	150	200	0.04	0.05
T-4 Sump	298	3	0.5	97	1	0.1	20	1	80	50	75	0.01	0.02
HERPES	13	25	8	67	0.3	0.1	1	1	5	15	15	0.00	0.00
Combustor Drop-out Tank & PRV	13	25	8	67	0.3	0.1	1	1	5	9	9	0.00	0.00
Total Sec Cond.					**70**	**20**	**1,080**	**110**	**4,690**	**1,304**	**2,099**	**0.33**	**0.52**
Phos Dock													
Tank 1	3,000	29	4	68	80	10	190	140	1,120	150	175	0.04	0.04
Tank 2	2,800	18	5	77	40	10	170	67	880	50	50	0.01	0.01
Tank 3	2,800	31	4	65	80	10	170	125	1,040	150	175	0.04	0.04
Tank 4	2,800	6	1	94	10	1.1	170	11	720	50	50	0.01	0.01
Tank 5	2,800	10	2	88	20	3.2	170	32	770	150	175	0.04	0.04
Tank 6	2,800	15	2	83	30	4.5	170	45	820	300	420	0.08	0.11
Tank 8 CP Receiver (V-5105)	900	0	1	99	0	0.4	60	4	240	105	300	0.03	0.08
Tank 9 CP Receiver (V-5106)	900	0	1	99	0	0.4	60	4	240	105	140	0.03	0.04
BPR (Burning Plant Recycle) (T-5060)	1,784	0	1	99	0	0.6	110	6	440	50	75	0.01	0.02
CFT (Centrifuge Feed Tank) (T-5009)	2,800	47	8	45	180	30	170	294	1,520	200	350	0.05	0.09
Lamella Clarifier Sludge Underflow (CLF-5135)	200	39	7	54	9.0	1.5	13	15	90	150	200	0.04	0.05
Lamella Recycle Hot Water) (V-5137)	1,056	3	1	96	2.4	0.4	66	4	270	100	100	0.03	0.03
NE Sump (T-5130 & T-5131)	963	4	1	96	2.4	0.4	60	4	250	150	175	0.04	0.04
North Solids Tank (T-5126)	227	2	0.3	98	0.3	0.1	14	0.5	60	5	5	0.00	0.00
Multiclone Feed Tank (T-5118)	463	4	1	95	1.2	0.2	29	2	120	105	105	0.03	0.03
East & West Displacement Tanks (T-5146 & T-5147)	200	2	0.4	97	0.3	0.1	13	0.5	50	30	40	0.01	0.01
V-3800 P4H2O to Pond	668	3	0	97	1.2	0.2	42	2	170	105	115	0.03	0.03
V-3801 Dock Operating H2O	1,337	1	0	98	1.2	0.2	83	2	340	105	115	0.03	0.03
Intercept Sump (T-5128)	134	17	3	80	1.8	0.3	8	3	40	50	50	0.01	0.01
Total Phos Dock					**460**	**70**	**1,770**	**760**	**9,180**	**2,110**	**2,815**	**0.53**	**0.70**
Subtotal Process Areas					**566**	**96**	**3,140**	**930**	**15,220**	**4,154**	**5,874**	**1.04**	**1.47**
Rail Cars													
Sludge Cars		45	10	45	10	2	10	21	90	0	0	0.00	0.00
Empty P4 Shipping		7	1	92	410	70	5,415	678	23,590	6,780	13,560	1.70	3.39
Sub Total Rail Cars					**420**	**70**	**5,420**	**1,940**	**23,680**	**6,780**	**13,560**	**1.70**	**3.39**
TOTAL					**990**	**170**	**8,560**	**2,870**	**38,900**	**10,934**	**19,434**	**2.73**	**4.86**

Furnace	Furnace Burden Capacity (ft3)	Furnace Burden (k lbs)
No. 1 Furnace	500	45
No. 2 Furnace	7,400	666
No. 3 Furnace	7,400	666
No. 4 Furnace	7,000	630
Total		**2,007**

TABLE 5

Immediate Shutdown Scenario

Equipment / System	Plant Shutdown Waste Material Summary									Level of Effort for Removal/Packaging			
										Man-days for Removal/Packaging		Years for Removal/Packaging	
	Capacity	Concentration (% wt)			Quantity (k lbs)				30 Gal Drums	With use of Pond	Without use of Pond	Assuming 4 x 4 man crew	Assuming 4 x 4 man crew
	(ft3)	P4	Dirt	Water	P4	Dirt	Water	Sludge	(Number)	for water management	for water management	with use of Pond	without use of Pond
Furnace Building													
No. 1 Fce P4 Sump (V-1231)	Cleaned									0	0	0.00	0.00
No. 2 Fce P4 Sump (V-2231	1,471	10	1	89	10	1	90	10	400	200	250	0.05	0.06
No. 3 Fce P4 Sump (V-3231)	1,471	24	4	72	30	4	90	44	500	200	250	0.05	0.06
No. 4 Fce P4 Sump (V-4231)	267	31	6	63	10	2	20	20	130	105	105	0.03	0.03
No. 1 Fce P4H2O Sump	Cleaned									0	0	0.00	0.00
No. 2 Fce P4H2O Sump	535	4	1	96	1	0.2	30	2	130	25	35	0.01	0.01
No. 3 Fce P4H2O Sump	535	4	1	96	1	0.2	30	2	130	25	35	0.01	0.01
No. 4 Fce P4H2O Sump	134	11	2	88	1	0.2	10	2	50	25	35	0.01	0.01
V-3700	100	11	1.8	88	1	0.2	10	2	50	105	115	0.03	0.03
V-3600	600	3	0.5	97	1	0.2	40	2	170	105	115	0.03	0.03
Total Furnace Area					**56**	**8**	**320**	**84**	**1,560**	**790**	**940**	**0.20**	**0.24**
Secondary Condenser													
T-1 Sump	7,300	6	2	92	30	10	460	50	2,000	540	900	0.14	0.23
T-2 Sump	7,300	6	2	92	30	10	460	50	2,000	540	900	0.14	0.23
T-3 Sump	2,178	7	1	93	10	1	140	10	600	150	200	0.04	0.05
T-4 Sump	298	3	0.5	97	1	0.1	20	1	80	50	75	0.01	0.02
HERPES	13	25	8	67	0.3	0.1	1	1	5	15	15	0.00	0.00
Combustor Drop-out Tank & PRV	13	25	8	67	0.3	0.1	1	1	5	9	9	0.00	0.00
Total Sec Cond.					**70**	**20**	**1,080**	**110**	**4,690**	**1,304**	**2,099**	**0.33**	**0.52**
Phos Dock													
Tank 1	3,000	29	4	68	80	10	190	140	1,120	540	660	0.14	0.17
Tank 2	2,800	18	5	77	40	10	170	67	880	150	200	0.04	0.05
Tank 3	2,800	31	4	65	80	10	170	125	1,040	175	225	0.04	0.06
Tank 4	2,800	6	1	94	10	1.1	170	11	720	75	75	0.02	0.02
Tank 5	2,800	10	2	88	20	3.2	170	32	770	175	200	0.04	0.05
Tank 6	2,800	15	2	83	30	4.5	170	45	820	300	420	0.08	0.11
Tank 8 CP Receiver (V-5105)	900	0	1	99	0	0.4	60	4	240	105	140	0.03	0.04
Tank 9 CP Receiver (V-5106)	900	0	1	99	0	0.4	60	4	240	105	140	0.03	0.04
BPR (Burning Plant Recycle) (T-5060)	1,784	0	1	99	0	0.6	110	6	440	50	75	0.01	0.02
CFT (Centrifuge Feed Tank) (T-5009)	2,800	47	8	45	180	30	170	294	1,520	540	660	0.14	0.17
Lamella Clarifier Sludge Underflow (CLF-5135)	200	39	7	54	9.0	1.5	13	15	90	225	275	0.06	0.07
Lamella Recycle Hot Water) (V-5137)	1,056	3	1	96	2.4	0.4	66	4	270	100	100	0.03	0.03
NE Sump (T-5130 & T-5131)	963	4	1	96	2.4	0.4	60	4	250	150	175	0.04	0.04
North Solids Tank (T-5126)	227	2	0.3	98	0.3	0.1	14	0.5	60	0	0	0.00	0.00
Multiclone Feed Tank (T-5118)	463	4	1	95	1.2	0.2	29	2	120	105	105	0.03	0.03
East & West Displacement Tanks (T-5146 & T-5147)	200	2	0.4	97	0.3	0.1	13	0.5	50	30	40	0.01	0.01
V-3800 P4H2O to Pond	668	3	0	97	1.2	0.2	42	2	170	105	115	0.03	0.03
V-3801 Dock Operating H2O	1,337	1	0	98	1.2	0.2	83	2	340	105	115	0.03	0.03
Intercept Sump (T-5128)	134	17	3	80	1.8	0.3	8	3	40	50	50	0.01	0.01
Total Phos Dock					**460**	**70**	**1,770**	**760**	**9,180**	**3,085**	**3,770**	**0.77**	**0.94**
Subtotal Process Areas					**586**	**98**	**3,170**	**954**	**15,430**	**5,180**	**6,810**	**1.30**	**1.70**
Rail Cars													
Sludge Cars		60	10	30	760	130	380	1,260	5,080	2,520	2,940	0.63	0.74
Empty P4 Shipping		2	0	98	410	70	25,340	678	103,320	6,690	16,950	1.67	4.24
Sub Total Rail Cars					**1,170**	**200**	**25,720**	**1,940**	**108,400**	**9,210**	**19,890**	**2.30**	**4.97**
TOTAL					**1,760**	**300**	**28,890**	**2,890**	**123,830**	**14,389**	**26,699**	**3.60**	**6.67**

Furnace	Furnace Burden Capacity (ft3)	Furnace Burden (k lbs)
No. 1 Furnace	500	45
No. 2 Furnace	7,400	666
No. 3 Furnace	7,400	666
No. 4 Furnace	7,000	630
Total		**2,007**

IDD 9518
FFSL
11/13/01

Turndown Schedule for the Astaris Pocatello Plant

November 13, 2001

Summary of Turndown Plan

On October 11, 2001, Astaris announced that the Pocatello Plant would cease production by the end of December 2001. Astaris plans to cease phosphorus production from #3 Furnace on or about December 10, 2001 followed by a 7-day period to remove phosphorus product from tanks and sumps and load this product into rail cars for shipment to customers. All P4 production work activity at the Pocatello Plant should end on or about December 17. Between October and December 17, plant personnel will institute a phased turndown of Plant processes coupled with winterization efforts to ensure that critical systems are protected from freezing.

Major pieces of equipment not operating as of October 26 are shale receiving and unloading (rail car unloading), shale stockpiling, #1 Calciner (and associated equipment), and #1, #2, and #4 Furnaces (and associated CO gas handling and slag ladling equipment). Shale receiving and unloading has been secured and weatherized. Information on the status of other currently idled equipment is provided below under Turndown Plan.

Major pieces of equipment that continue to operate are the reclaim wheel, shale crushing and screening, briquetting building, #2 Calciner (and associated equipment), nodule stockpiling and reclaiming, nodule fines management, the proportioning building, nodule sizing, #3 Furnace (and associated CO gas handling and slag ladling equipment), the secondary condenser, the XSCO burner, the phosphorus loading dock, and the (steam) boilers. All air pollution control equipment associated with the process equipment will continue to operate until the source ceases operation. Certain air pollution control equipment will be maintained in an operable condition for potential use in controlling fugitive emissions while decontaminating equipment. The process equipment will be shut down on various dates followed by isolation, appropriate cleaning, weatherization, and securing as described in greater detail below.

Turndown Schedule

Plant personnel are instituting a phased turndown of the operating equipment listed above. The schedule for this phased turndown is described more fully below.

1. Shale Berms

The reclaim wheel removed as much shale as possible from the North Berm by October 19. The reclaim wheel was moved to the South Berm and will continue to operate on the South Berm until about November 10. Shale on the contingency pile will be removed by about November 12.

2. #1 Calciner

#1 Calciner was shut down September 7, 2001 per the normal operating schedule. After the announcement on October 11 that the Plant would cease production, planning for the cleaning and weatherization of #1 Calciner began immediately. On October 24, the CO gas supply line to #1 Calciner was washed following routine procedures for a maintenance outtage. P4 washed from the CO line was pumped to the phos dock for loading/processing. On October 25, the #1 Calciner scrubbers and associated water system piping were cleaned and drained. Removal of dry material from the #1 Calciner windboxes and primary header will begin on or about November 8 and will take approximately 7 to 8 days.

3. #1 Furnace

#1 Furnace was shut down in October 2000 because of high power costs. The #1 Furnace was disconnected from the power supply in April 2001 and the decision was made to decontaminate and demolish this furnace and ancillary equipment. Decontamination and demolition commenced in May and has progressed during the course of 2001. Certain ancillary furnace equipment has been removed from the Furnace Building and the furnace contents were removed with the intent to recycle this material to the operating furnace. With the October 11 announcement to terminate production, only a minimal amount of #1 Furnace material can be recycled before the last furnace is shut down. Decontamination and demolition of #1 Furnace will proceed on a low priority basis during turndown and shutdown.

4. #4 Furnace

#4 Furnace was shut down on April 1, 2001 because of high power costs. The #4 Furnace was disconnected from the power supply in April 2001 and washed and secured for potential re-energizing if needed in the future. On October 16, work began to decontaminate #4 Furnace and ancillary equipment containing residual P4. These systems include the sumps, pressure relief valve (PRV), and CO line. The furnace contents will not be removed during turndown and shutdown.

5. #2 Furnace

#2 Furnace was shut down on August 15, 2001 per the normal operating schedule for one furnace operation. #2 Furnace is being held in reserve for use during the turndown if #3 Furnace needs to be shutdown due to an upset condition. On or about November 24, if #2 Furnace is not utilized, the electrodes from #2 Furnace will be removed. The sump, CO line and PRV will then be washed following routine procedures for a maintenance outtage.

6. Phosphorus Dock Storage Tanks

On October 16, preparations were initiated for cleaning of #4 Tank. Cleaning of the tank began on October 24. Tanks 1, 2 and 3 will be cleaned following completion of #4 tank. Phosphorus materials from these tanks will be processed on the phosphorus dock for recovery and recycle as centrifuge product (CP).

7. Secondary Condenser

The secondary condenser will be shut down, isolated, and prepared for long-term weatherization starting on or about November 14. The condenser will be cooled down, water systems drained, and a nitrogen purge will be established on the vessel to prevent the possibility of fire. On or about November 15, the contents of the secondary condenser sump (P4 product) will be pumped directly to a rail car. After this date, the small amounts of P4 that will be collected in the secondary sumps will be sent to the phosphorus dock for loading into railcars as P4 product. The secondary condenser sumps must be maintained in a hot condition to support the continued operation of the XSCO combustor. On or about November 15, the secondary condenser cooling tower will be emptied.

8. #2 Calciner

#2 Calciner will produce nodules until November 14. On or about November 14, #2 Calciner will be isolated and work will begin to wash the CO line associated with #2 Calciner, wash and drain the scrubber system, and remove dry materials from the windboxes and primary header which is expected to be completed on or about December 1. The handling systems (dry lime injection and lime slaking) and water treatment system will be flushed and cleaned after #2 calciner is isolated. After November 14, only the stockpiled nodule inventory will be fed to the operating furnace. The nodule stockpile is expected to be depleted on or about December 10.

9. Calciner Ponds

Following the shutdown of #2 Calciner, any remaining calciner scrubber water in Calciner Pond 2C will be transferred to Calciner Pond #5C in preparation for draining the calciner scrubber return water supply lines. The water level in Pond 2C must be lowered below the return water lines in order to isolate/drain the water lines from Pond 2C to the calciner scrubbers to prevent freezing during the winter. Draining Pond 2C is environmentally important because a frozen line could break and possibly rupture. The calciner ponds will remain isolated with water and sediments in place until a decommissioning/remediation plan is developed.

10. Shale Handling, Crushing, and Screening System

When the #2 Calciner stops producing nodules on or about November 12, then shale feed will no longer be needed. The shale handling, crushing, and screening system will be depleted of shale as much as possible. The outdoor crushed shale contingency pile will be removed on or about November 12. The reclaimer wheel will be backed out of the shale berm and prepared for storage.

11. Coke Unloading

The coke unloading building and associated dust collection and baghouses will remain in operation until about December 10. The coke unloading system will be run out and emptied as much as possible.

12. Briquetting Building

Similar to shale handling, when the #2 Calciner stops producing nodules on or about November 12, then shale briquetting will no longer be needed. Conveyors, feed chutes and bins will be emptied with the exception of bins #3, 4 and 8 which are expected to have oversized material that will require additional effort to empty.

13. Phosphorus Dock Centrifuge System

On December 7, centrifuge product (CP) delivery from the phos dock to the operating furnace will be stopped. The CP system will be flushed and secured following routine procedures for a maintenance outtage.

14. #3 Furnace

On or about December 10, the last operating furnace - #3 Furnace - will cease production of phosphorus. The CO line will be isolated and the process of purging the line will commence. All phosphorus product will be pumped to the phosphorus dock. On or about December 11, washing of the #3 precipitators will begin. This work will take approximately 3 to 4 days. Following the shutdown of #3 Furnace, any process equipment that was not isolated/secured during turndown will be secured, isolated, and fire prevention purges will be established as appropriate.

> Environmental Note: All of the furnace Medusa/Andersen scrubbers and the industrial clarified water (ICW) system will be maintained in an operable condition in order to support further decommissioning and securing activities and potentially to support future demolition work on the furnaces.

15. XSCO Combustor

The XSCO Combustor will be shutdown after final purging of the CO line is completed. The CO line will be purged after the last operating furnace is shutdown, cools down and stops degassing. A nitrogen purge will be maintained on the CO line until such time as the line can be decommissioned. At the time the XSCO combustor is shutdown and cooled down (2 to 3 days), work will begin to prepare all systems for extended shutdown.

16. Proportioning Building

When the #3 Furnace stops producing phosphorus on or about December 10, then furnace feed will no longer be needed and the proportioning building will be closed. Feed chutes and conveyors will be run out and bins emptied as much as possible.

17. Nodule Sizing

When the #3 Furnace stops producing phosphorus on or about December 10, then furnace feed will no longer be needed and the nodule sizing equipment will be closed. Feed chutes, bins and conveyors will be run out and emptied as much as possible.

18. Slag Ladling and Slag Pile

When the #3 Furnace stops producing phosphorus on or about December 10, the furnace will no longer produce slag and slag ladling will be discontinued.

19. Phosphorus Dock Area

After the furnace ceases production of phosphorus on or about December 10, all sumps and tanks will be pumped down to load phosphorus product. The phosphorus product will be loaded into rail cars for shipment to customers. All P4 production work activity at the Pocatello Plant will cease on or about December 17. Cleaning of returned rail cars (containing phossy water and "heels" of precipitated phosphorus compounds) will continue throughout the turndown period.

20. Plant Boilers

The steam boilers, fired on natural gas, will continue to operate to prevent line freezing during the winter. Steam condensate currently discharges to Pond 18, and we intend to continue this discharge during winter and spring 2002 which will decrease the potential for the pond freezing. The ICW system (decant water pumped from Pond 18 Cell B) will remain in operable condition to charge the Furnace Building fire suppression water systems.

21. Ponds

Discharge of phosphorus production wastes (precipitator slurry and furnace washdown) from the production areas of the Plant will cease on or about December 17. Steam condensate currently discharges to Pond 18, and we intend to continue this discharge during winter and spring 2002 which will decrease the potential for the pond freezing. The ICW system (decant water pumped from Pond 18 Cell B) will remain in operable condition to charge the Furnace Building fire suppression water systems. The Pond Management Plan will continue to be implemented after December 17, including security and air monitoring, until final closure activities are completed.

< END >

FMC Pocatello, Idaho	SAFETY POLICY	SAF-GEN-829
	PHOSPHORUS MINIMUM MANDATORY STANDARDS	Issue Date 05/05/95 Supersedes Date 5/20/91
		Page 1 of 8
Prepared by: Dan Lyon		Approved by:

FFSL 11/13/01

PURPOSE:
The Phosphorus Minimum Mandatory Standards (P_4MMS) set the base level standards and establish consistency throughout the Group when working with or around elemental phosphorus. P_4 MMS are not intended to restrict or limit each plant from developing more stringent standards as appropriate to their particular process.

SCOPE:
These standards apply to all CPG locations producing, consuming or otherwise handling elemental phosphorus.

ACCOUNTABILITY:
The safety and health of all employees is the highest priority objective for all FMC locations. Every employee is responsible for his/her own safety and that of his fellow employee. He/she must know and follow all safety rules and procedures which apply to the plant, the area and the tasks he/she performs. Responsibility for personal safety goes beyond following established safety rules. Each employee must think through each task before doing them and establish additional safety procedures specific to the circumstances.

Supervision and management are responsible for overall safety performance and for training employees both in established safety rules and procedures and for establishing high standards which reinforce these principles.

I. **POLICY**:

A. **Personal Protective Equipment:**

Personal protective equipment (PPE) is intended to protect employees from phosphorus when working in an area of high potential exposure or when performing tasks which have significant potential for phosphorus exposure. PPE must be in good physical condition and must be worn as designed in order to be effective. PPE provides protection from direct contact with phosphorus for a limited time (10 to 20 seconds). Therefore, it is imperative that a source of water is available in the immediate area. Acceptable water sources include safety tub, safety shower, or a charged water hose.

1. Approved aluminized short coat and pants (or aluminized bib overalls and coat). Approved aluminized gear is Steel Grip AGL1136-30CAA and AGL8440G Aluminized Glass or Aluminized Carbon Kevlar. Aluminum gear must overlap at least 6" on coat and pants and pants must be worn over the boots with at least 4" overlap. Pants should not be so long as to drag on the ground.

2. Safety hard hat (hood optional)

3. Polycarbonate full face shield (hood optional)

4. Safety glasses (or chemical goggles)

5. Loose fitting gauntlet type (4" minimum skirt) gloves of rubber or leather construction. They should be loose fitting so they can be slung off. Short wrist length gloves are not permitted nor are leather gloves with cloth back. Gloves of longer skirt length may be used where the application is appropriate.

6. Rubber or non-porous treated leather boots extending above the ankle. The objective is to prevent phosphorus from entering the boot.

B. **Line Breaking and/or Entering Phosphorus Equipment:**

All phosphorus and phosphorus related equipment in phosphorus processing areas will be considered as phosphorus lines when maintenance and/or entering is required. Phosphorus equipment shall include but not be limited to:

* Phossy water lines
* P_4 jacket water
* P_4 burners
* Slurry lines (Pocatello)
* P_4 lines
* Acid furnace vessels
* Steam lines
* Centrifuge Product Lines:
  - Steam Trace Heating Lines (Pocatello)
  - Inert gas connections to furnace feed chutes and electrode seals (Pocatello)
  - Furnace PRV's (Pocatello)
  - Acid lines between P_4 furnace and storage tanks
  - Acid tanks
* Condensate return lines
* CO lines
  - CO_2, nitrogen, natural gas, inert gas air connections to P_4 vessels or lines
* P_4 cars/container (non-routine)
  - Water supply lines that connect to P_4 or phossy water lines
  - All equipment downstream of P_4 furnaces (Pocatello)
  - P_4 spill containment systems
  - Chlorine supply to reactor
  - Tasks performed on the furnace platforms/roofs (Pocatello) which have the potential to expose personnel to heat and fire require the use of a tapping jacket, a face shield, and a suitable water supply.

These tasks include, but are not limited to: packing electrode seals, changing feed chute insulators, rodding feed chutes, rodding the off-take, and inserting blanks in the feed chutes.

* **Exceptions shall not be given under any circumstances to the "asterisked" items.**

1. Personal protective equipment, checklists, safety watch - who's only function is to provide safety protection, pre-work planning sessions, and work permits applicable to P_4 lines shall also be applicable to all equipment noted above. Exceptions to these standards will be allowed when a more detailed procedure is written to protect against the presence of P_4 in the equipment. Any line, vessel or equipment that may potentially contain phosphorus is presumed to contain phosphorus until supervision ensures that procedures are in place and qualified personnel ensure that it is free of phosphorus.

2. Appropriate personal protective equipment shall be worn until qualified personnel complete all the required reviews and sign off that all procedures have been completed, to render the equipment free from phosphorus.

3. In non-P_4 areas, the risk is considered very minimal, and these procedures are not mandatory. However, the possibility of P_4 presence during line or vessel opening shall be periodically reviewed in these non-P_4 areas.

4. When it can be determined that the possibility of phosphorus is extremely unlikely, a general procedure may be written for line opening/entering to cover these requirements.

5. Whenever practical, backflow prevention devices should be installed on utility and process lines going to the P_4 areas.

C. **Training:**

Each plant location shall develop a training program (including an annual audit system) for those tasks associated with elemental phosphorus

handling. All operations, maintenance and other impacted personnel will receive initial training and subsequent annual refresher training.

1. Training programs at a minimum shall include a plan, a standard of acceptable performance, a record keeping system to document qualifications and plans for refresher training.

2. Personnel are forecast (budgeted) to conduct and receive the training. Instructors should be selected on previously developed criteria to ensure excellence.

D. **Engineering Standards:**
Materials of construction, equipment selection, fabrications, and testing of phosphorus process piping and processing equipment shall meet individual plant Engineering Standard specifications. These specifications will be reviewed as appropriate for applicability and consistency during subsequent P_4MMS reviews.

E. **Drills:**

1. Each plant shall have a minimum of four simulated phosphorus emergency drills per year. These should include the use of equipment to contain the emergency and should cover both day shift and back shifts and should occur on each unit to maximize response exposure. Newly assigned personnel will be trained on drills before assuming full job responsibility.

2. A complete emergency plan incorporating adequate alarm and communication systems shall be in place.

F. **Marking of Dangerous Areas (permanent and temporary):**
Each plant must clearly identify those areas which are hazardous and require P_4MMS protective clothing and entry restrictions. The areas are to be clearly marked (as hazardous phosphorus areas which require minimum protective clothing) and entry restricted to authorized personnel only.

G. **Identification of Phosphorus Lines:**
All lines containing phosphorus, slurry, or phossy water are to be permanently identified according to individual plant standards and applicable regulatory requirements.

H. **Flange and Pump Seal Covers, Flange Gaskets:**

1. Flange covers - All lines used specifically for handling elemental phosphorus and slurry are to have effective flange covers. Flange

covers for lines carrying phossy water will be used in high exposure/risk areas as determined by each plant.

2. Flange gaskets - Individual plants shall follow their respective Engineering Standards for appropriate flange gasket application. For reference: Pocatello Engineering Standards specify Lamons style WR, chlorocarb spiral wound gaskets with 316L centering ring meeting AP 601 for all phosphorus, centrifuge product, sludge, slurry, and hot phossy water lines. Garlock bluegard 3400 ring gaskets, 1/16" thick meeting ANSI B16.21 shall be used on cold phossy water line flanges. P_4 car/container gaskets shall match original manufacturer specifications.

3. Pump seal covers - All phosphorus, phossy water and slurry pumps which have seals in exposed locations (i.e., not contained within a pit or tank) are to have effective covers.

I. **Phosphorus Loading/Unloading:**

1. The P_4 loading/unloading area shall be clearly defined and be restricted to authorized personnel only.

2. Personal protective equipment must be worn in the area at all times during the heating, loading, and unloading process.

3. Safety tubs and a water deluge system must be in place, properly maintained and tested on a routine basis.

4. Two means of egress from the P_4 cars are required with a safety tub at each egress.

5. A safety watch with a charged water supply must be present when anyone is on top of a phosphorus car operating valves, connecting or disconnecting lines. Alternatively, in lieu of a safety observer, an observation system may be used which must include: remote video monitoring, remote operated deluge system, remote audio communications, and remote alarm activation with a rescue plan. The remote systems must be staffed during any valve operation or line breaking activity on the top of a P_4 car. This alternative may only be used for a closed loop unloading system under normal operating conditions. (Unplugging or burning open a P_4 standpipe requires adherence to Standard 11).

6. The heating cycle of the car must be controlled according to individual plant standard procedure. The procedure must address the potential of overheating a car which can cause expansion of the phosphorus into the valving and piping on top of the car.

7. The water overflow gooseneck must be directed away from the work area.

8. No instrument should be forced into a P_4 car, but must drop on its own. If forcibly removing that instrument ever becomes necessary, a deflector must be available to protect the operator.

9. Any unusual problems must be reported to supervision before additional work is done on the car.

10. Applicable DOT Regulations will be followed for loading and unloading P_4 cars.

11. Plants which load and/or unload Phosphorus shall develop a loading/unloading system with procedures which meet the following criteria:
    a) Manages the potential hazards of phosphine accumulation and exposure to personnel and equipment during the heating and loading/unloading process.
    b) Eliminates phossy water spillage from the top of P_4 cars during the loading/unloading process.
    c) Requires backflushing of the phosphorus standpipe prior to disconnecting the line from the car. These must be positive indication that the backflush has occurred.

J. **Safety Showers and Tubs:**

1. An effective safety shower and safety tub or deluge system shall be provided in phosphorus handling areas and at potential exposure sites.

2. Safety tubs will be provided at the burner level and at phosphorus loading/unloading areas.

3. Alarms will be provided for tubs and showers in remote areas unless an approved alternate procedure for communications is used.

K. **Phosphorus Line Unplugging:**

All plants should make a maximum effort to free a P_4 line of phosphorus

M. **Inspection of Phosphorus Lines:**

1. All plants must have an inspection and testing program for phosphorus lines to verify structural integrity.

2. Special emphasis is to be given to elbows and tees.

N. **Communications:**

1. All OSHA or MSHA recordable phosphorus burns with initial investigation results must be reported to the Manufacturing Director and the CPG Corporate Safety Manager. In addition, near misses with the potential to have caused a P_4 burn as well as injuries resulting in actual burns should be communicated to the appropriate internal and external P_4 consumers and users in a timely manner. In accordance with plant policy, the above occurrences must also initiate the near miss or accident investigation process.

2. Effective communications will be established between plants handling phosphorus. Communications include:
   a) Phosphorus burns will be reviewed as appropriate by plant personnel during the annual PERT conference.
   b) Additions or improvements necessary in the Minimum Mandatory Phosphorus Standards.
   c) Significant plant incidences.
   d) Operating and maintenance safety improvements (including piloting studies).
   e) Changes in safety procedures (manuals).
   f) Design engineering criteria.
   g) Advances in state of the art technology
   h) Revisions in phosphorus handling procedures.
3. In-plant communications shall be established to disseminate necessary information to affected employees.

4. The minimum phosphorus safety standards must be reviewed at least every two years or more frequently as required.

Date: 6-18-99

FMC Corporation
Phosphorous Chemical Division
Lawrence, Ks.

SUBJECT: Procedure for Removing and drumming Phosphorus Pit Material.

1.0 PURPOSE:
This procedure describes the necessary precautions and steps that will be used in the removal and drumming of P_4 residue and sludge material from the Phosphorous storage pit. It must be kept in mind that this procedure addresses a non-routine activity. This procedure may change as the process evolves. Any significant change that will affect or influence Personal Safety, the Environment, or the Community will cause the activity to cease and the procedure modified to control the activity in the appropriate manner.

2.0 HAZARDS:
A wide variety of hazards are associated with this type of activity. This is a safety critical procedure. Injuries can result from P_4 burns, strain, fume and smoke inhalation. A water deluge system has been installed on the perimeter of the concrete walls of the pit. This is supplied with water from the plant fire protection system. This deluge system must be operational and charged anytime material is being removed from the pit. A charged water hose must be readily accessible to the employees that are involved in the removal of material from the pit. Self contained breathing apparatus (SCBA) will be available in close proximity to the job site for use in case of emergency.

3.0 PRECAUTIONS:

The following Lawrence Safety Procedures will apply and be conformed to during removal and drumming of material from the P_4 pit.

3.1 Procedure 901; Personal Protective Equipment
3.2 Procedure 902; Lock, Tag, and Verify
3.3 Procedure 910; Ladder Safety
3.4 Procedure 918; Respiratory Protection
3.5 Procedure 934; Confined Space Entry
3.6 Procedure 939; Phosphorous Mandatory Standards
3.7 Procedure 940; Handling P_4 Burns
3.8 Procedure 941; Protective Clothing & Equipment Required for P_4 and Phossy water
3.9 Procedure 942; Phosphorous Firewatch Procedure
3.10 Procedure 943; Work on Phosphorous Equipment
3.11 Procedure 947; Sampling Phosphorous from Pits, Tanks, or Cars.
3.12 Procedure 948; Removal of Steam coils from the P_4 pits
3.13 Procedure 992; Safety Pre-qualifications for On-site Contractors

4.0 RESPONSIBILITIES:

4.1 All employees involved in the cleaning of the P_4 pit are responsible for seeing that all safety precautions are being followed. The Special Projects Leader will see that the applicable Safety forms are filled out and that a daily pre-work planning session has been held. Daily 5 minute safety discussions will be held by all personnel involved.

4.2 Note: Each day, the PO4 Team Leader will be informed when the activity of removing and packaging material from the P_4 pit begins and ends so as to inform the Emergency brigade.

4.3 At the end of each day the entire Pit area will be secured, equipment examined and made free of Pit material. All pit material will either be appropriately packaged or have a protective layer of water over the amount that is remaining in the pit.

5.0 PROCEDURE:

5.1 Removal of pit material will be done by mechanical means involving and not limiting to the use of a Back-Hoe, Tracked-Hoe, Crane and bucket, Uni-Loader, Jack-Hammers, Shovel and rock bar. The material will be kept under water as much as is possible to limit and curtail the potential for Phosphorous fumes and smoke.

5.2 At least four people are required for drumming of material from the pit.

(1) A person experienced with Phosphorous will be on fire watch with a charged fire hose.
(2) The owner/operator of the Back-hoe and uni-loader. This person will only be involved to the extent that the equipment is used. This person will not have direct exposure to material in the pit. A five-minute SCBA pack will be in his possession throughout the activity.
(3) An operator to handle a fork truck with a 8' x 6' x 2' rectangular pan attached to the forks.
(4) A person to man a water hose to wash excess material off the bucket of the Hoe as it removes the pit material and to ensure that material is kept wet during the removal process to avoid fires and smoke.

5.3 The pit material will be moved from the pit as portrayed in this scenario.

5.3.1 The backhoe will lift the pit material up out of the pit and carefully deposit the material into the pan. The pan will have a level of water that will sufficiently cover the pit material

5.3.2 When the pan is full, the bucket of the backhoe will be washed off and moved out of the work area

5.3.3 The operator of the forktruck will maneuver the pan to the designated packaging area. This arc will be in close proximity of the area that is being worked.

5.3.4 A smaller rectangular pan will be placed adjacent to the pan with the pit material. A 30 gal. 1A2 steel drum will be placed in this smaller pan with a shallow level of water in case any pit material is spilled during the transfer to the drum. The steel drums themselves will be filled with water to a third of their capacity. This water will be displaced by the pit material as they are filled.

5.3.5 Sand will be stockpiled in close proximity of the packaging operation in the event of a drum being upset and contents spilled. The sand will be use for covering the pit material and can be shoveled back into the drum.

5.3.6 A person experienced with phosphorus will be staged with a charged fire hose as a firewatch during the drumming operation.

5.3.7 The material will be transferred from the larger pan to the drum with shovel and or 2 gallon. bucket. This activity will be performed by two people experienced with handling phosphorus.

5.4 When the drums are sufficiently full (a 2" to 4" vapor space for freezing should be left) they will be sealed with silicone caulk and labeled with the appropriate labeling for proper D.O.T. shipping. They will be shipped as a Class 4 flammable. UN1381. The drums will be stacked onto wooden pallets with a forktruck and appropriate loading device for lifting the drums. The drums will be steel banded together to secure the individual pallets of drums. The drums must be so braced as to prevent motion thereof relative to the vehicle while in transit.

5.5 As the material is removed from the pit, the potential for uncovering the inactive steam coils will increase. The coils were used to heat the pit when it was actively used for storage of P_4. These coils are carbon steel pipe that will contain pit material. They will have to be handled carefully and reduced in size in order to package them as well in the 1A2 steel drums. The coils should be reduced by either a band saw or pipe cutter. The cutting of the pipe can generate sufficient heat to ignite the material that is in the coil so the cutting process must be accomplished the coil under a water blanket

5.6 As material is removed from the pit it may be necessary to wash down the walls of the pit to remove residual material to prevent burring.